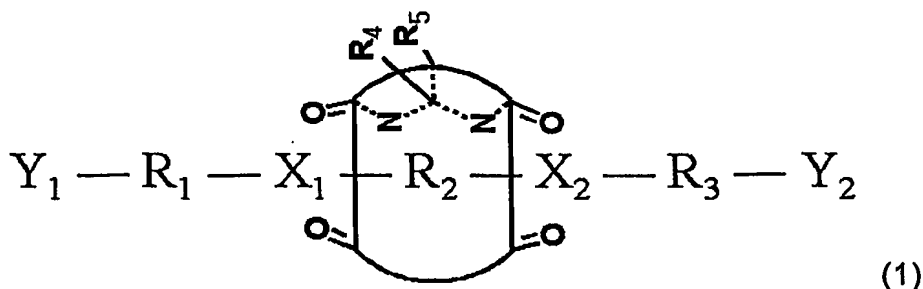
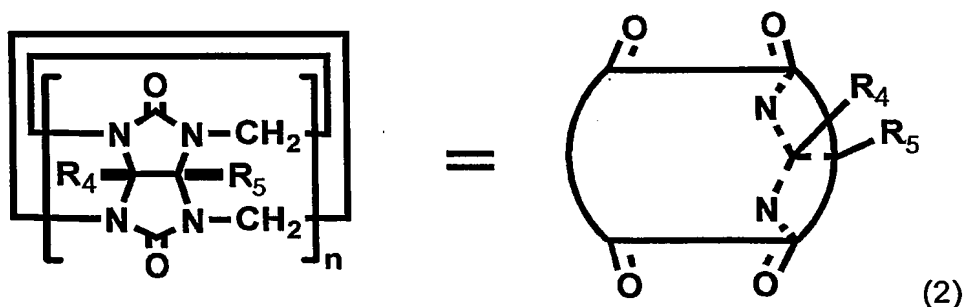


CLAIMS

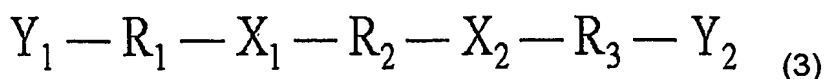
1. A compound represented by Formula 1 below in which a compound of Formula 3 below vertically passes through a cavity of cucurbituril or its derivative of Formula 2 below:



wherein R_1 , R_2 , and R_3 are each independently saturated or unsaturated linear C_2 - C_{10} alkylene, ethyleneglycol oligomer, 1,4-substituted benzene, or 1,4-substituted pyridine; X_1 and X_2 are each independently a positively charged functional group for ion-dipole interaction with an oxygen atom of cucurbituril or its derivative of Formula 2; Y_1 is a functional group for a linkage with a biomaterial comprising a gene or a protein; and Y_2 is a functional group for a linkage with a solid substrate,



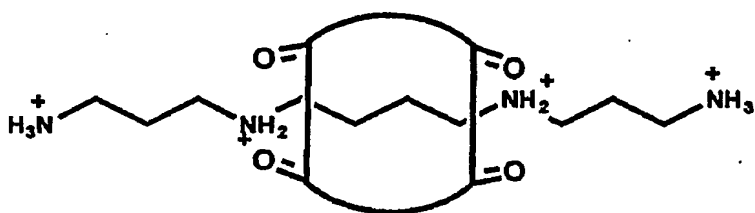
wherein n is an integer of 4 to 20; and R_4 and R_5 are each independently hydrogen, an alkenyloxy group with an unsaturated bond end and a substituted or unsubstituted alkyl moiety of C_1 - C_{20} , a carboxyalkylsulfinyloxy group with a substituted or unsubstituted alkyl moiety of C_1 - C_{20} , a carboxyalkyloxy group with a substituted or unsubstituted alkyl moiety of C_2 - C_8 , an aminoalkyloxy group with a substituted or unsubstituted alkyl moiety of C_2 - C_8 , or a hydroxyalkyloxy group with a substituted or unsubstituted alkyl moiety of C_2 - C_8 , and



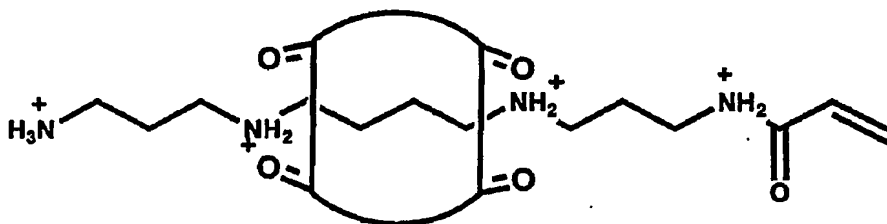
wherein R_1 , R_2 , R_3 , X_1 , X_2 , Y_1 , and Y_2 are as defined in Formula 1 above.

2. The compound of claim 1, wherein X_1 and X_2 are each independently secondary ammonium, 1,4-substituted pyridinium, or benzyl ammonium; and Y_1 and Y_2 are each independently a primary amine group, an amide group, an acrylamine group, an alkylester group, an aldehyde group, a carboxyl group, an alkoxy silane group, a halogenated acyl group, a hydroxyl group, a thiol group, a halogen group, a cyan group, an isocyan group, or an isothiocyan group.

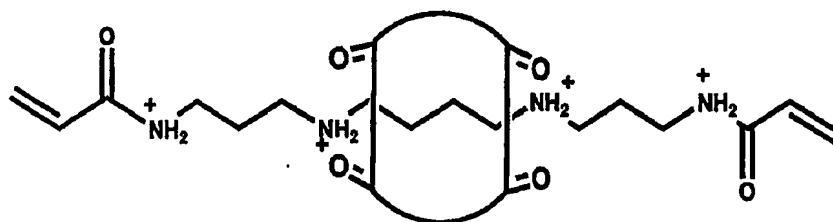
3. The compound of claim 1, which is selected from the group consisting of compounds represented by Formulae 5 through 13:



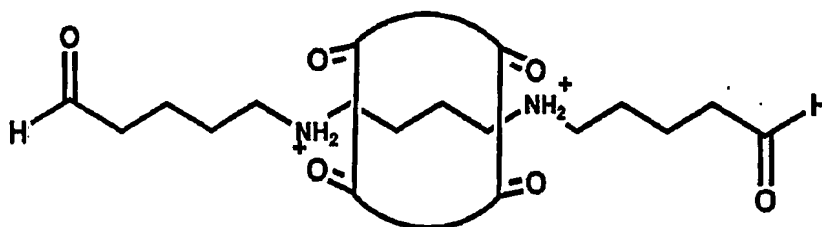
(5)



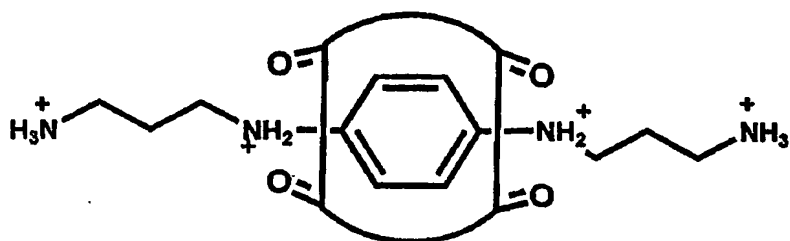
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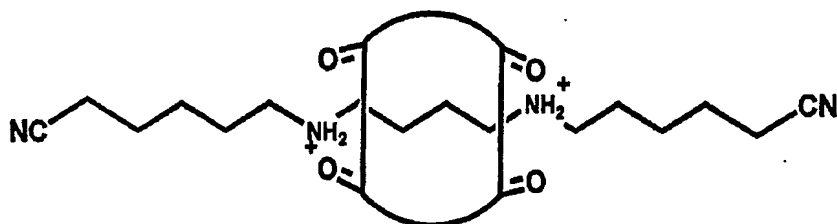
(7)



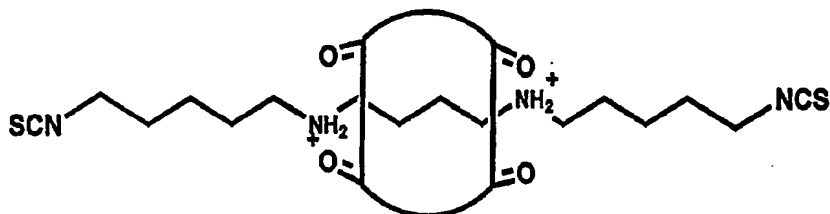
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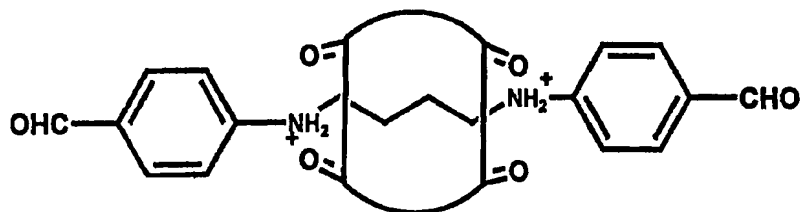
(9)



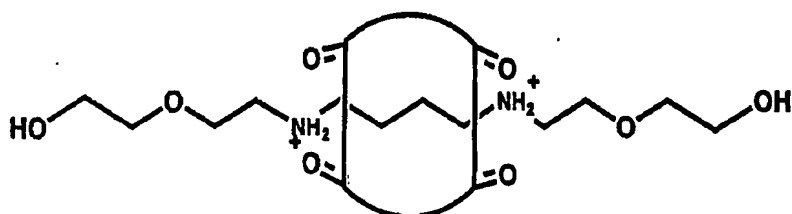
(10)



(11)



(12)



(13)

4. A solid substrate bonded with a compound of Formula 1 via a covalent

bond or a non-covalent bond.

5. The solid substrate of claim 4, wherein the compound of Formula 1 is present in a density of 0.05 to 0.6 compounds/nm².

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6. The solid substrate of claim 4, which is a glass, a silicon wafer, an indium tin oxide (ITO) glass, an aluminum oxide substrate, or a titanium dioxide substrate.

7. A gene chip comprising the solid substrate of any one of claims 4 through 6.

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8. A protein chip comprising the solid substrate of any one of claims 4 through 6.

9. A sensor for biomaterial assay comprising the solid substrate of any one of claims 4 through 6.

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